MAY 1934 ● VOL III No 1

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See Page 6

The A.S.T.E. Journal

AMERICAN SOCIETY OF TOOL ENGINEERS

To Production Executives

Sunoco Helps You Secure ..Rated Machine Tool Capacity ..at Minimum Cost

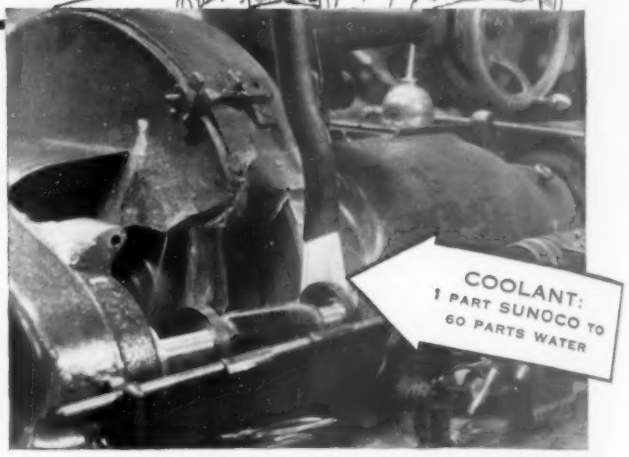
IN your efforts to lower machining costs, don't overlook the real importance of an efficient cutting lubricant. Without it, machine tools will not operate at rated capacity. And it is significant that machine tool manufacturers use and recommend Sunoco Emulsifying Cutting Oil.

Faster and Deeper Cuts Made Possible

With the aid of Sunoco, many executives have definitely increased machine hour production. Faster and deeper cuts are possible. Work is kept cooler. Accuracy and finish, even at higher speeds, are kept at the same high plane. Longer runs between tool grinds and less lost time for re-setting, too, make for economy.

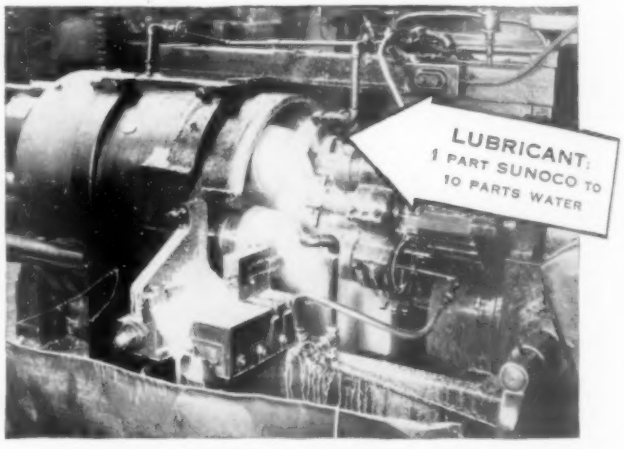
The ability to estimate the production capacities of cutters, drills, taps, reamers and other small tool equipment, is a valuable aid in computing manufacturing costs. The uniformity of Sunoco permits accurate prediction on the quantity of work that machine tools will produce.

It will pay you to get the facts on Sunoco. Tests in your plant will gladly be made, and our experienced cutting oil engineers are at your service.



Courtesy of **MUSKEGON MOTOR SPECIALTY** *Co. Jackson, Mich.*

OPERATION: FINISH GRIND. CRANKSHAFT CENTER MAIN BEARING. PLUNGER CUT.
MACHINE: LANDIS GRINDER.
MATERIAL: H. R. TYPE "E. E." STEEL.
SPINDLE SPEED: 750 R.P.M.
WHEEL SIZE: 30 INCH DIAM., 2.188 INCH FACE.
STOCK REMOVAL: .025 INCH.
PRODUCTION: 40 PER HOUR.



Courtesy of **NATIONAL ACME** *Co., Cleveland, Ohio*

OPERATION: ROUGH BORE AND ROUGH TURN STEEL FORGING.
MACHINE: GRIDLEY 4-SPINDLE, 4½ INCH CHUCKING MACHINE.
SPINDLE SPEED: 160 R.P.M.
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TURN: 114 FEET PER MINUTE.

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The A.S.T.E. Journal

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AMERICAN SOCIETY OF TOOL ENGINEERS

T. B. Carpenter, President
R. M. Lippard, First Vice-President
Ford R. Lamb, Second Vice-President
A. M. Sargent, Secretary
Joseph F. Slavik, Treasurer

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O. B. Jones, Editor
8203 Woodward Avenue
Detroit, Michigan
Madison 8422

Roy T. Bramson, Bus. Mgr.
7338 Woodward Avenue
Detroit, Michigan
Trinity 2-8510

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INFORMATION PERTAINING TO MEMBERSHIP IN THE AMERICAN SOCIETY OF TOOL ENGINEERS may be had by addressing the Secretary's office. All matters relative to the Society should also be addressed to the Secretary's office—8316 Woodward Avenue, Detroit, Michigan. Telephone Madison 2057.

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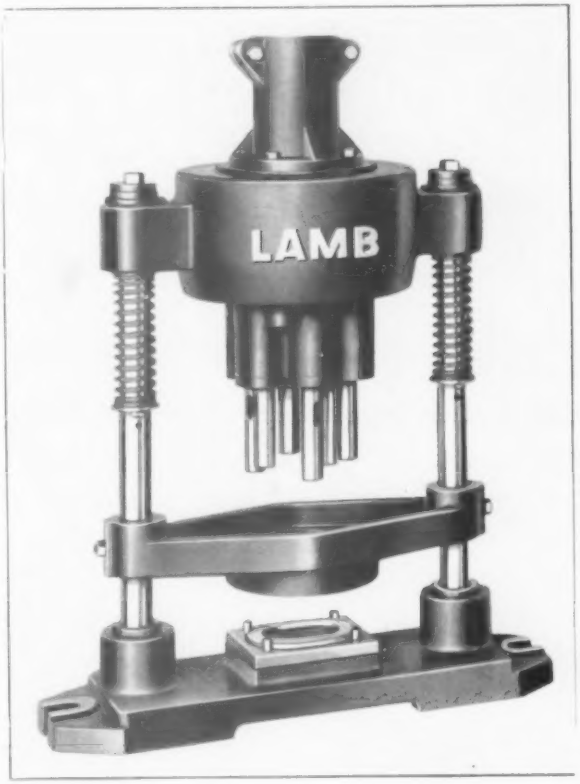

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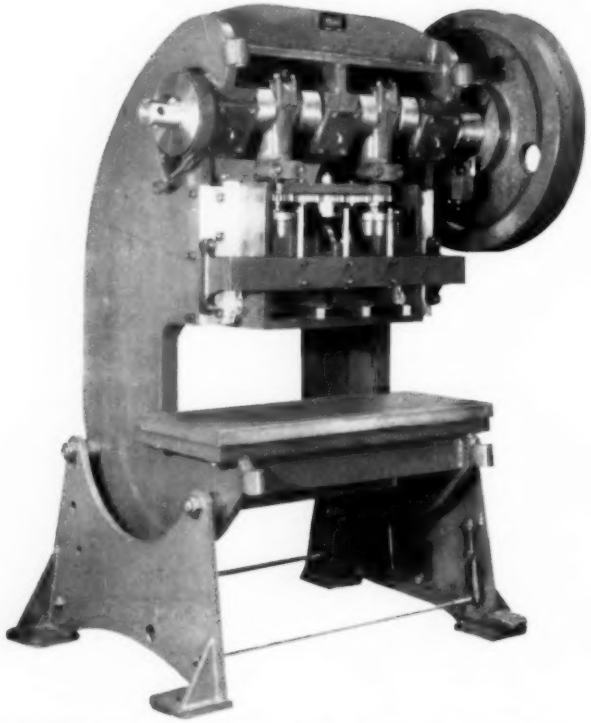

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New Officers Installed at April Meeting

T. B. CARPENTER
Newly Elected President A.S.T.E

OUR new President is a young man—in his early thirties—who, nevertheless, has had wide and varied experience as a tool engineer. T. B. Carpenter is a splendid example of a youthful manufacturing executive who has come up from the ranks.

Starting out as an apprentice tool- and die-maker to his father in the shops of the St. Louis Car Company, his experience takes him through many of the nation's largest plants embracing tooling and research on varied products from typewriters to automobiles.

Judging from his first talk before the members at the April meeting, we have every reason to believe the Society will continue to grow and prosper under the aggressive and intelligent leadership of Mr. Carpenter. Some of the enthusiasm and interest he radiates as our new President will be felt by a perusal of the digest of his speech, published below.

(*Continued on page 7*)

Carpenter Sees Bright Future for A.S.T.E.

"Mr. Chairman, fellow-members and friends: It would be quite difficult for me to accurately describe the mixed feelings that are mine in standing before you for the first time as your President.

"I shall sincerely do all in my power to fulfill the obligation to the best of my ability. If I can only succeed in maintaining the high standard of executive direction and guidance set by my good friends and counsellors, Joe Siegel and Bill Smila, it seems certain that we should be able to make considerable advancement this year.

"One of these problems I shall try and deal with now, or at least to clarify to some extent. It is the belief of all scientific and technically trained men that you cannot change a fact by what you think about it, nor by what you say about it. Therefore, I am not making any startling disclosure when I admit that there is another Society recently organized by and composed principally of our friends and associates—the tool and die designers.

"This society that I speak of is organized along different lines and for a different purpose than we are. Their principal purpose, according to their literature is the stabilizing and bettering of wage and working conditions among the tool and designing engineers who actually push the pencils across the drafting boards—a very praise-worthy purpose.

"It is the hope of our Society as well as of everyone connected with the Industry that these boys will continue to further their aims in the quiet, orderly, and gentlemanly manner that has characterized their activities thus far.

"The clearest expression of our purpose and the means by which we hope to gain it are best expressed in our Constitution. Article I, Section 3, which I will now read:

"'Article I—Section 3. In order to advance, promulgate, and further the Arts and Sciences in Tool Engineering among the members of the Society; to bring about good fellowship fraternity and the spirit of brotherhood among the members; to hold readings and discussions on professional papers and reports at meetings; called for that purpose; to publish and disseminate such papers and reports to the members—this society is created.'

"There are no hidden meanings in these words. This Society is for alert, ambitious men who desire in an intelligent manner to further themselves in their chosen profession by interchange of social and educational contacts and ideas.

A Society for *Tool* Engineers

"We intend to make this a Tool Engineering Society for Tool Engineers. Any engineering work requires close attention to minute details. We will, therefore, go into and get closer to the practical details of tool engineering. We intend to have a good sociable time doing it.

"Some of the steps by which we hope to accomplish this are as follows: We will immediately proceed to set up, publish and distribute to members only, approved tool standards in such form that they can be readily made into a serviceable looseleaf binder. We will attempt to hold a few open discussions for members only at which we will ask our members to bring any particular problems concerning the tooling or manufacturing methods of various parts to be manufactured or which are being manufactured. These matters are to be brought up for discussion and need not necessarily be in the form of a problem. I dare say every member of this Society has some pet jig, die, fixture, or tool

(*Continued on page 14*)

MAY MEETING

Thursday, May 10

GENERAL MOTORS BUILDING—Concourse Level

Dinner: 6:30 Members and Guests
GENERAL MOTORS BUILDING CAFETERIA—Concourse Level

Obtain tickets at door—$1 including checking

Make reservations through Secretary's Office—Madison 2057
or write—8316 Woodward Avenue, Detroit

TECHNICAL MEETING

New Developments in Lathe Design

by

STANLEY A. BRANDENBURG

Stanley A. Brandenburg, whose photograph is used on the cover of the Journal this month, of the Monarch Machine Tool Company of Sidney, Ohio, will address the meeting of members and guests at the May meeting of the Society. Mr. Brandenburg will discuss a new development of the Monarch company in automatic electric control of lathes. This new development is known as the "Magnamatic" and applies to magnetic clutches which control, automatically, both the feed and traverse of the front carriage, and of the front and rear tool slides. Cams are not used in the operation of this new type lathe. Diameters and lengths of cut are controlled by precision limit switches. This new development will be explained, and Mr. Brandenburg will accompany his talk with pictures. An entirely new principle in turning will also be illustrated.

A glimpse of Mr. Brandenburg's experience shows him to be admirably equipped to present a very interesting discussion on such a technical subject. He showed a keen interest in mechanical developments from early youth, serving his apprenticeship in the shops of the company he now represents. He is the inventor of many practical developments now in use and protected by patents. His work has taken him into plants throughout the country.

Plan to come—bring a guest.

APRIL MEETING

The April Meeting of the Society was held at 8 p.m. in the General Motors Building—Concourse Level. This meeting was addressed by two speakers—C. B. Harding and Albert Carter. Mr. Harding reresen,pting the Sun Oil Company presented a paper on "Cutting Fluids, Their Nature and Application," which because of its unusual nature is reprinted elsewhere in the Journal this month. Mr. Carter's talk pertained to methods used by the Police Department of Detroit in combating drug traffic.

ROBERT "Bob" M. LIPPARD
First Vice-President-Elect

FORD R. LAMB
Second-Vice-President-Elect

ALBERT "Al" M. SARGENT
Secretary-Elect

JOSEPH F. SLAVIK
Treasurer-Elect

NEW OFFICERS INSTALLED AT APRIL MEETING

(Continued from page 5)

Next at the helm of A.S.T.E. destinies for the ensuing year is our good friend, affectionately known as "Bob" Robert M. Lippard, who has been connected with the tool, gage and machinery industry for thirty years. Mr. Lippard, judging from his genial smile and interest at installation ceremonies, welcomes his opportunity to serve in the capacity of First Vice-President for the Society.

No better fitted man could be found to serve the Society in the capacity of an officer, for Bob knows the tool engineering profession from the ground up. He served his apprenticeship in the early days with General Electric. Then, as tool maker in various plants throughout the East, he equipped himself unmistakably for the practical, sound sales engineer and counselor he is today.

At present Bob is Branch Manager in Detroit for the Heald Machine Company of Worcester, Massachusetts.

* * *

Ford R. Lamb is the newly elected Second Vice President. Mr. Lamb has served the Society in many ways since its inception. He has served as chairman of the important Publications Committee, which was responsible for the publication of the Journal, during its first year.

Mr. Lamb is well known as a tool engineer particularly in the automotive industry. He has worked on production, tool making, tool designing and production engineering. While connected with the Studebaker Corporation, Mr. Lamb had charge of Mathematical Instruction of apprentices for five years. While in the employ of Studebaker Mr. Lamb was also assistant to the Production Engineer.

Mr. Lamb is well known to many of our members for his invention of the Modern stud setter and at present is connected with the Modern Tool Works division of Consolidated Machine Tool Corporation in the capacity of Sales Engineer. He is known as a specialist in threading and stud-setting problems.

Albert "Al" Marden Sargent, our Secretary since the organization of the Society is re-elected. Al makes a good Secretary, as members know, and we are fortunate to have him accept the office for another term. The duties of the Secretary are many, varied and often irksome. Mr. Sargent deserves much credit for the splendid manner in which he has handled the affairs of this office. As the Secretary, his office is virtually a clearing house for information of all kinds pertaining to the Society, and he is often very hepful to members in ascertaining certain facts as related to the Tool Engineering profession in this district.

Mr. Sargent, is President and General Manager of the Pioneer Engineering & Manufacturing Company. Prior to organizing this, his own company, he had a widespread experience as tool and die maker and designer, grinding department superintendent, Chief Engineer, Assistant Superintendent experimental department, plant engineer, Vice President in charge of Engineering and General Manager of a machine manufacturing company.

Members may reach him at his office 8316 Woodward Ave., Detroit, MAdison 2057.

* * *

Mr. Joseph F. Slavik is re-elected A.S.T.E. Treasurer for the ensuing year. He was born in Cleveland, Ohio, where is located the Warner & Swasey Company and with whom "Joe" connected at an early age. Serving a four year period as apprentice in Machine Shop work, he has progressed through the following capacities, setup man in turret lathe department, assistant foreman drill press department, demonstrator estimator, small tool salesman and, at present Service Representative and Sales Engineer for the The Warner and Swasey Company in the Michigan territory.

Joe Slavik is friendly. Make his acquaintance, if you don't already know him.

CUTTING FLUIDS --- THEIR NATURE AND APPLICATION

C. B. HARDING, *Cutting Oil Engineer*
Sun Oil Company

THE present low cost of modern manufacturing, as compared with the practice of twenty years ago, is due very greatly to the much higher speed with which metal parts can be machined to a required degree of finish and accuracy. This is due to improvement in machine tool design, improvement in tool steels and grinding wheels, and at least in equal measure to improvement in cutting fluids. Neither of these three developments could have proceeded very far without the assistance of the other two.

The great improvement of the role played by cutting fluids is apt to be overlooked because, while the metallurgy of tool steels is understood very well indeed, the real action of a cutting fluid is really largely a matter of theory and our knowledge of cutting fluids is almost entirely empirical.

Cutting fluids undoubtedly perform three main functions—the first we might call lubrication, though whether it is the same kind of lubrication that occurs in a bearing may be questioned. The second is the cooling effect, keeping down the temperature of the edge of the tools and the chip which it is separating from the work. The third is the mechanical removal of chips by the stream of liquid.

It has been found that for almost every type of machine work there is a particular form of cutting fluid which gives the best results. Cutting fluids consist of the following, termed:

1. Animal, Vegetable, or Fish Oils alone.
2. Mineral Oil.
3. Mineral Oil compounded with Animal, Vegetable or Fish Oil.
4. Mineral Oil combined with Sulphur.
5. Almost any combination of the previous four.
6. Mineral Emulsifying, or so-called "Soluble Oils."

Animal, Vegetable or Fish Oils generally are used alone for operations where application is made by brush or squirt can.

Mineral Oil has been used in few instances, and while high in lubricating value, does not adequately provide the other essentials of a satisfactory cutting fluid.

Mineral Oils compounded with Animal, Vegetable or Fish Oils are successfully applied to operations where speeds are high and feeds are light and also to machining such metals as brass, copper, aluminum, etc., where sulphur compounds would cause a discoloring of the metal.

Mineral Oils chemically combined with Sulphur have proven efficient on operations where high pressure and low speeds prevail. They can also be used where high speeds and light feeds are present; therefore they are used as a general utility cutting lubricant by many metal cutting plants.

Mineral Oils with Animal, Vegetable or Fish Oils, combined with Sulphur, are ideal for operations where finish is of primary importance, and the fact that this type of oil is transparent is of added advantage in that the work can easily be inspected through the oil film.

Emulsifying or "Soluble Oils" when mixed with water in various proportions have a wide use in shops where duplicate parts are manufactured. These emulsions are applied to the tool contact in a volume of several gallons per minute under slight pressure. They also serve as an excellent grinding lubricant. They are high in refrigerating value and low in cost per diluted gallon.

A satisfactory Emulsifying or "Soluble Oil" should have the following qualities:

Should emulsify in hot or cold water and stay in emulsion (stability of an emulsion is necessary).
Should be slightly alkaline (emulsions acid in reaction aid in the formation of rust spots and discoloration of metals).
Should not gum or oxidize parts or machinery.
Should be soothing, not aggravating to the skin.
Should be hygienic.
Should be free from sediment and foreign matter.

APPLICATION OF ANIMAL, VEGETABLE OR FISH OIL USED ALONE AS A CUTTING FLUID

Of the Animal Oils those generally used are Lard Oil, Oleic Acid and DeGras (wool-fat). Of the Venetable Oils the product most used is rape seed. Of the Fish Oils those most often used are Sperm and Menhaden Fish Oil.

These products can be used alone as cutting fluids, but with the exception of Lard Oil, which flows freely, they must be applied by brush or squirt can. These operations are hand tapping, hand threading, hand reaming; or operations mechanically done but the tools are manually fed into the work.

Lard is an excellent cutting fluid for almost any operation. It flows quite freely at normal temperatures and thus can be pumped and circulated. Used by itself the consumption would be high, compared with other types of cutting fluids; it would be expensive and therefore its use is restricted.

APPLICATION OF MINERAL OILS ALONE USED AS A CUTTING FLUID

It would seem reasonable that Mineral Oils, being high in lubricating value, should serve efficiently as cutting fluids. In a few instances they have been used, but with only fair results. Mineral Oils alone do not have all the essentials of a satisfactory cutting fluid. They lack metal wetting properties, and the ability to lubricate under the pressure and temperature conditions present in metal cutting.

Mineral Oils of the correct grade are ideal vehicles with which other products may be compounded or combined and the resultant is a suitable cutting fluid.

APPLICATION OF MINERAL OIL COMPOUNDED WITH ANIMAL, VEGETABLE OR FISH OILS— USED AS A CUTTING FLIUD

Mineral Oils when compounded with Animal, Vegetable or Fish Oils, acquire the quality of metal wetting. Cutting fluids of this form are successful on operations where speeds are high and feeds are light, such as high speed automatics machining free cutting metals. They are also used when cutting such metals as brass, bronze, copper, aluminum, etc., where sulphur compounds might discolor.

APPLICATION OF MINERAL OILS COMBINED WITH SULPHUR USED AS A CUTTING FLUID

Cutting fluids composed of Mineral Oil combined with 1% to 4% of Sulphur are now receiving considerable attention for mass production operations. Oils combined with Sulphur in an active form provide qualities permitting them to work efficiently on operations where high pressures and low speeds prevail; such as broaching, tapping, threading, gear cutting, gear shaping and finishing. They can also be used satisfactorily on operations where high speeds and light feeds are present. They fill a long felt need for one product with the greatest number of applications.

The reason cutting fluids of Mineral Oil combined with Sulphur have not been generously used in the past, is primarily due to the difficulties encountered in combining the Sulphur active and also prevent its loss, by precipitation or by being carried away.

APPLICATION OF MINERAL OILS COMPOUNDED WITH ANIMAL, VEGETABLE OR FISH OILS AND COMBINED SULPHUR USED AS A CUTTING FLUID

Cutting fluids composed of Mineral Oils with Animal, Vegetable or Fish Oils and also combined with Sulphur, are being used to an increasing extent. By reason of the Sulphur being present and active, these cutting fluids are efficient on operations where finish is of primary importance. To better explain their advantages: applied to an automatic screw machine, where tapping and threading operations are being performed, they will invariably aid in producing better threads with improved finish and with longer tool life than will compounds of Mineral Oil with either organic oils or sulphur alone.

APPLICATIONS OF EMULSIONS OF MINERAL OIL AND WATER USED AS A CUTTING FLUID

The resultant products of Emulsifying or "Soluble Oils" when mixed with water are termed emulsions and their use as cutting fluids has increased greatly during the past few years. They are ideal for mass production manufacture. They are high in refrigerating value and thus more quickly dissipate the heat developed in cutting operations than do other forms of cutting fluids.

While in some measure the use of emulsions as cutting fluids has been restricted, in that they do not provide as high a type of lubrication as do other forms of cutting fluids; nevertheless in a shop manufacturing duplicate parts, there are many operations to which they can be applied. They serve efficiently with regard to tool life, tolerances and finish. They deposit on the part machined a slight but impervious film which protects it against rust during its passage through its various operations. Their extensive application results in low manufacturing costs.

An oil for emulsions, to be suitable for all conditions, should not contain rancid animal or vegetable fats, rosin oil, ammonium hydrates, coal tar products, crude carbolic acid or alcohol.

Emulsions with animal or vegetable fats present will ultimately turn rancid, by reason of the decomposition of these fats, and so become septic. When rancid materials are used in the manufacture of the Emulsifying or Soluble Oil, the emulsions will give off obnoxious odors after prolonged use. They cause skin troubles to the operators of the machines on which they are used.

Coal tar products and crude carbolic acid are used as antiseptics in emulsions that tend to become septic. They do not eliminate the conditions of decomposition, and have no value as a cutting agent.

Alcohol is used in emulsions as a binder to hold the various agents together and as an aid to saponification. Alcohol is volatile under normal temperatures and will therefore evaporate from the emulsion causing it to become unstable. Fumes of denatured or wood alcohol have a harmful effect on the eyes of the operators.

It is important that emulsions remain permanent, otherwise they would be constantly losing percentages of their constituents and would be apt to plug the circulating system.

In the past emulsions used as cutting fluids have only been applied to such machining operations as turning, milling, drilling, boring, reaming, facing, etc. Emulsions of correct proportions of oil and water can be successfully used for other operations. Recent experiences have proven their adaptability to such machining operations as gear cutting, blanking of nuts, tapping, threading, broaching and grinding.

Emulsions properly applied must be supplied to the tool contact with the work in a volume of several gallons per minute under slight pressure. The outlet of the dispensing system should be large enough to permit a flow over all the tools engaged.

The Emulsifying or "Soluble Oil" must be suitable for shipment and storage in any general type container, such as drums, tanks or tank cars without deterioration either in its original form or in emulsion. When completely emulsified with water it must remain stable.

APPLICATION OF EMULSIONS OF MINERAL OIL AND WATER USED AS A GRINDING LUBRICANT

Emulsions of oil and water can be used as satisfactory grinding lubricants. The beneficial effect of the emulsion in this operation is considerable. It increases the life of the wheel; it increases the number of pieces ground to tolerance and finish before the wheel must be redressed; it improves the ease of operation of many of the moving parts of the machine and, of equal importance, the general cleanliness of the machine, the tanks and piping system.

Emulsions high in excess alkalinity are generally not successful with regard to machine life. The excess alkaline content destroys the lubrication of the table saddle and other machine units, thus causing difficulty in their operation.

APPLICATIONS OF EMULSIONS OF MINERAL OIL AND WATER TO RUSTPROOFING

Emulsions that are stable can be used for rustproofing. Their correct application to this operation will reduce rustproofing costs to a minimum. Emulsions with a high concentration of oil are most effective and the mixture most generally used is one part of mineral oil to three parts of water.

The part to be rustproofed is immersed in the hot emulsion, kept there until it has absorbed some of the heat from the emulsion, and then withdrawn. When withdrawn the part has on all surfaces a film of the emulsion (oil and water). The heat which it has absorbed aids in dispelling the moisture from the film, thus leaving on the part only a transparent film of oil. This oil film provides ample protection against the formation of rust for general storage purposes.

Editor's Note

Mr. C. B. Harding, a recently elected member of A.S.T.E., will be pleased to answer any questions appertaining to the subject of cutting oils. A.S.T.E. JOURNAL readers are invited to send such questions to the JOURNAL for a prompt response.

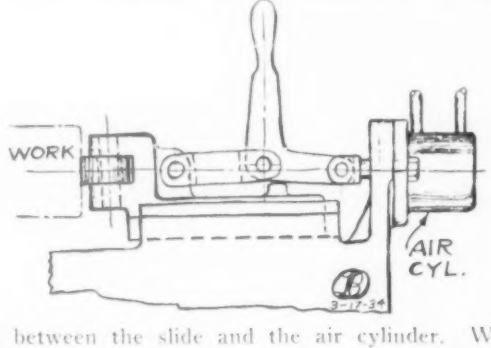
A CONSTANT-PRESSURE CLAMP

By B. L. DIAMOND

A device for maintaining a constant pressure against a workpiece which is drawn along by a chain conveyor is shown in the figure below.

A roller, mounted on roller bearings, is carried in the sliding member. This roller is held against the workpiece by means of the short-stroke air cylinder which has a stroke only long enough to take care of the irregularities in the work.

As more space is required for loading the fixtures than is provided by the travel of the air piston, a toggle clamp is

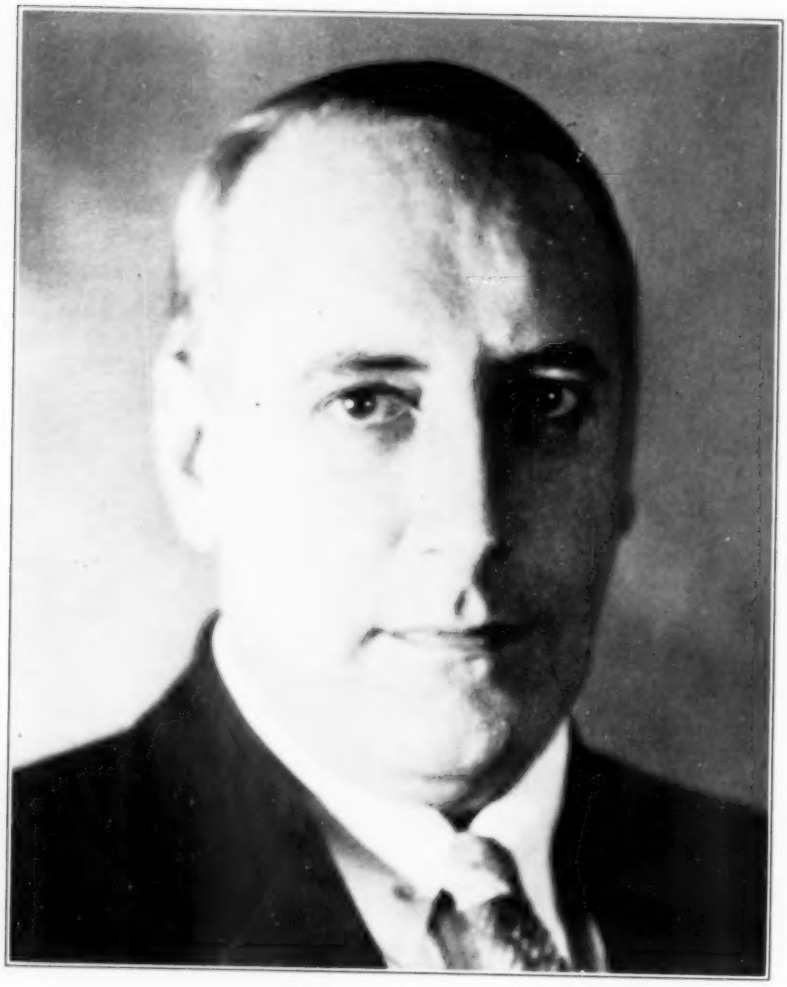


placed between the slide and the air cylinder. With the stroke of the piston back, the toggle can be operated to provide the necessary loading clearance.

As will be seen in the sketch, regardless of the amount of pressure developed in the toggle due to differences in the thickness of the work, the pressure remains constant, for the toggle is backed up by the air cylinder and a greater resistance merely backs the air up in the line.

DISPLACEMENT OF MEN

By JOHN YOUNGER



JOHN YOUNGER
Professor of Industrial Engineering, Ohio State University

John Younger was born in Scotland and served a five year's apprenticeship with the Glasgow Locomotive Works. He is an engineering graduate of the University of Glasgow.

He has been in charge of tool departments of the Arrol-Johnstone Motor Car Company and the Dennis Motor Car Company, both of England. After resigning from the position of assistant works manager of the Dennis Motor Car Company of England he came to the United States.

After surveying some of the industries of the country, he joined the Pierce Arrow Motor Car Company as chief engineer of their truck division.

He resigned this position in 1917 to become chief of the engineering division of the Motor Transport Corps of the United States Government. For this work he received the Distinguished Service Medal of the United States.

In 1914 he resigned a position which he had held for four years as vice-president of the Standard Parts Company of Cleveland in charge of their manufacturing operations to become Professor of Industrial Engineering at the Ohio State University, which position he now holds.

He is a Fellow of the Royal Society of Great Britain and is a member of the leading American engineering societies and was Vice-President of Production for the Society of Automotive Engineers. The A.S.T.E. Journal nominates him for Honorary Membership in The American Society of Tool Engineers.

YEARS ago our great grandfathers cut their screw threads in a laborious manner by taking the bar of steel, marking off the path of the thread, and then by hammer and chisel and file they would cut away until they had a resonably satisfactory thread. The job took a long time, perhaps a full day of 12 hours, for one screw thread and the resultant cost of screw threads was very high. Estimating a wage of 20 cents an hour for a skilled man at that time, the labor cost of the job would be about $2.40 each. There were comparatively few men employed because on account of the cost the demand for screws was strictly limited.

Then came a series of inventions, such as the screw cutting lathe and the die head, and so on, culminating in today's process of rolling the threads by reciprocating dies. Today a man shovels blanks into a hopper and the machine does the rest, turning out perfect screws at the rate of one every five or ten seconds. Thousands of men are employed in the industry, because the resultant cost of the product is so small (they are sold in the 5- and 10-cent stores) that every one can buy them. Screws are no longer a rarity but have become one of the most plentiful of our engineering products.

This result is entirely due to the many inventions which have contributed not to the displacement of men but to the lowering of men's labor costs. If we had made the jump suddenly overnight there would have been a displacement of men, but we did not do that—we never do it. It takes time to bring in and develop new inventions, and during that time the men displaced are reabsorbed.

Let us see what this means. One man made a screw thread in 12 hours by hand 100 years ago. Today he makes over 8000 in the same space of time. In other words, if we were working today under old methods it would take 8000 times the men we employ, or if we have 2000 men today in the bolt and screw industry, we would have had under the old method 16,000,000, an altogether ridiculous number.

Now, how have these men been absorbed? Well, you know the tremendous advance in 100 years. We have seen the tremendous electrical industry develop—we have seen the equally tremendous automobile industry develop. This latter industry in all its ramifications has absorbed some 5,000,000 men in new pursuits in 30 years. All of these things have come about by reason of invention and by use of labor-displacing machinery, both lessening cost, so that more may buy and more be produced.

The foregoing is what might be termed the broad, "long pull," far-sighted view of what happens when machine tools are introduced and inventions made. There is, however, another viewpoint and that is the immediate viewpoint.

At occasional intervals I put this question to my class. "Suppose you were an engineer told to design a machine tool or a fixture and you find out that its use is going to displace five men. What will you do?" Now this class is probably typical of the young men of the country. Their invariable attitude is to go ahead with the design. Their reasons are many and among the most interesting is one which shows that these men believe that work must be given to mental ability, even if physical ability suffers. In other words, the inventor, the designer, is just as much, if not more entitled to work as is the physical laborer in the shop.

(Continued on page 13)

THE TOOL ENGINEER

By F. L. HOFFMAN

THE tool engineer of today must exercise almost supernatural powers in the performance of his duties. When the engineering department releases the drawings to him, he is expected to tool up the parts in an unbelievably short space of time, solving all problems related.

He may find some condition which permits or requires the use of a special machine or tool that is something out of the ordinary, and immediately sets the forces at work to develop his idea. Several engineers may be consulted and will ponder over sketches until a workable idea is developed. This idea is then turned over to the tool designer who will make layouts from these sketches which will show working conditions and eliminate "bugs." It is usually necessary and important that the engineer be consulted during the development of the finished design by the designer.

The wonderful development of the machine age is almost entirely due to the accomplishments of the tool engineer. It is a fallacy to think that any one engineer is capable of solving all problems which arise. Tool engineers gladly accept the assistance of their fellow engineers, whose collective ideas make development and advancement possible.

The tool engineer must follow the designing until completed, then keep in touch with the building of the device; assisting whenever questions of tolerance or assembly occur. When the device is completed he supervises the first operation of it, and will recommend changes to make it perform as anticipated, if necessary. If more than one device is to be built he studies the first one built in an attempt to improve it. It is much easier to criticize a machine or any other device after it is built and is running than while it is yet a drawing.

The lot of the tool engineer is to solve a continuous succession of problems, and many times several at the same time.

CUTTING TOOLS—DUE FOR RISE

"This company has experienced several depressions, and in each instance the "valley" or turning point upward has found manufacturing plants in the machinery and automotive industries with bare stock rooms and tool inventories reduced to a minimum. I regard the business outlook for the next few years and the next twelve months as being highly encouraging for the metal cutting industry." That is the opinion expressed by Mr. R. G. Michell, General Manager of the Eclipse Counterbore Company, Detroit, which celebrates, this month its twentieth anniversary.

"Uncertainty as to the future," says Mr. Michell, "has invariably delayed replenishment of these depleted stocks until long after the actual turning point upward has been reached. It is then that cutting tool manufacturers find themselves swamped with orders—and we are now experiencing that phase of the cycle."

All cutting tool manufacturers should now experience this healthy condition of business. Production, especially in the automotive industry, has been speeded up so much faster than the time required to produce machinery and special tools, that orders are now being placed far in advance of actual daily requirements. This is the condition that brings definite assurance for the immediate future in this industry.

CHRYSLER CHANGES PERSONNEL

Announcement is just made that E. H. Devor, former Master Mechanic at the Chrysler Jefferson Avenue Plant is now in the position of General Superintendent of Machine Shops.

W. H. Smila, formerly Chief Tool Engineer at the same plant is now made Master Mechanic at the same plant succeeding Mr. Devor.

Mr. Elmer Johnson who was formerly a Tool Engineer of the Chrysler Corporation is now made Chief Tool Engineer, succeeding Mr. Smila, at the Jefferson Avenue Plant, Detroit.

SPRING FROLIC A SUCCESS

By FORD R. LAMB

None present will deny that the 1934 Annual Spring Frolic of The American Society of Tool Engineers was a huge success.

Amaranth Hall was the spot chosen by Joe Siegel to stage this year's frolic, which was held Friday evening, April 27th. Even the weather man did his part in making the evening a success, for the evening was bright and cool.

A very fine program was put on in such an artistic way as to make every moment interesting. One feature of the program is especially deserving of praise and was highly applauded. The young man who played the Xylophone displayed a high degree of skill and *dexterity*. After playing several numbers using two and four mallets he demonstrated that his feet were skilled as well as his hands. Seatin himself atop a high stool which brought his feet level with the keyboard, he fastened a mallet to the sole of each shoe and played two numbers with his feet. Later, using two mallets in each hand, he played a six-mallet number with both hands and feet.

The entire program was excellent and was well received, but the most inspiring thing about the frolic was the pleasure of meeting and talking with former friends and fellow workers. Tool engineers, as they progress in their profession, come into contact with many fellow workers for a short duration of time after which they become separated and have no opportunity of renewing the acquaintance. A meeting such as this one affords an opportunity to meet in a spirit of good fellowship and to maintain friendships which otherwise would be impossible.

Meetings of this sort are of inestimable value for that reason alone and we are mighty glad to know that our new entertainment committee is planning to drop a number of these oases in the landscape of tool engineering activity in the ensuing few months.

Editor's Note—We understand that Mr. Lamb, the writer of this article, is no mean Xylophone player himself and as a tap dancer is par-excellence. The audience seemed to be thrilled as much by his renditions as they were by the professional performers. A few more frolics and the Meetings Committee will not have to go outside our membership for entertainers. Truly, the way to get acquainted with your friends is to play with them.

All work and no play really does make Jack a "dull boy." Tool engineers must be "bright." Its up to Joe to keep us shined up.

A TRIBUTE TO THE LADIES

When a mere man attempts to pay a tribute to the ladies its apt to remind one of a katy-did singing to the moon. Words seem so totally inadequate to the occasion.

Perhaps each tool engineer had better carry the message personally in his own way to his wife or sweetheart than for us to attempt the impossible through the pages of the Journal.

We have heard certain members gloriously praised for their unselfish and effective efforts to build up our Society.

We have not said as much as we should in praise of the contributions so graciously made by the wives, sweethearts, mothers and sisters who have been left at home all alone, until the wee hours of the morning, night after night, while our constitution was being drafted, committees were being organized and the many other tasks performed incident to the formation of the American Society of Tool Engineers.

It is "Just like a man," to take this unselfish sacrifice on the part of the ladies as a matter of course—just another act of heroic sacrifice which a woman makes so often in order that "her" man may be more successful in his world of men.

(Continued on page 13)

NEW OFFICERS PREPARED FOR YEAR OF PROGRESS

A year of further progress is assured for The American Society of Tool Engineers. Newly elected officers have all voiced their convictions that greater advancement shall be made along somewhat new lines and activities, making the Society of more practical and tangible value to its members. Read the digests below of what each new officer said upon his induction to office at the April meeting.

Robert M. Lippard, First Vice-President Elect

"I hardly know how to express in words my appreciation of your confidence in electing me to the office of First Vice-President. And I assure you I will do everything possible to carry out the work entailed to the best of my ability.

"I dont know as there is very much I can add to the remarks that our worthy President has made but there is one thing I would like to mention in a brief way—that is the matter of membership. We are a young organization. To be exact, I think about two years ago the Society was formed. At that time we had a very good membership. I rather think the good start we had at the outset perhaps gave us a little over-confidence, because we haven't continued to drive for membership.

"Of course, there are other Societies. For instance, the American Society of Mechanical Engineers, probably one of the pioneering societies. Then, there is the Society of Automotive Engineers. I have attended meetings of both of these Societies. They are made up of mechanical engineers, made up of technically trained men and they cover a very wide field. Out of the American Society of Mechanical Engineers grew the Society of Automotive Engineers. They devoted their activities to automotive lines. The trouble, as far as we are concerned, is they cover entirely too much ground for us. I often felt that when I attended their meetings I didn't get what I wanted. You might listen to a session on body or other technical subjects regarding motor building.

"So when this Society was formed, it was formed for the benefit of *tool* engineers. So I feel that this Society of ours offers a wonderful opportunity for the tool engineers to get together and meet men who are able to talk in their language.

"This memberhip is something we all have to get together on and get behind. I would like to feel that every member of our organization would feel in his own mind that he was a member of the membership committee. If everyone of our members would get one new member, it would be obvious we would be doing a good job. The members must get behind it and it is only through putting your thought into a thing that you get anything out of it.

"So I am going to close with the thought that this year we are going to keep the Society up to standard and we want your cooperation. We certainly owe a debt of gratitude to the former officers who have been so successful and we hope to keep up to their standard. Again I want to mention my appreciation of your confidence in electing me to this position and I shall support Mr. Carpenter in every possible way."

Ford R. Lamb, 2nd Vice-President Elect

"I don't know but what I was fortunate in being elected to second Vice-President. The most I will have to do is 'yes' the President. I want to thank the directors for electing me to this office and I want them to know I appreciate it and the opportunity.

"In attempting to take this job seriously I wondered just why such an organization should be. The Automotive Engineers have their organization and I can understand where they learned their work. Colleges taught it and other schools taught it. The Society of Mechanical Engineers have their organization. I can see where they learned their work. Colleges taught it. They got it from books. But I don't know where the Tool Engineer learned to be a tool engineer. The schools didn't teach it. It is only in the last two or three years that schools have been teaching it or the last few years that there have been any books on the subject and it seems that the tool engineers developed as a result of mass production. In order to have mass production, we have to have the tool engineer. But while he was doing this job, it seems to me he neglected something of vital importance and that was the developing of his personality, at the same time.

"During the past two years in connection with the work on the Journal, it has been necessary to get material for the Journal. It is natural to assume that you should go to a tool engineer for it. But that hasn't been the case. You go to a tool engineer and you get a reply something like this: 'I can't write any articles. I don't know anything about this that would interest anyone else.' That is a perfect example of a shrinking violet.

"The automotive engineer quite often becomes vice-president of the organization for which he works. Why shouldn't the tool engineer become second Vice-President? I believe he could. This organization gives the individuals an opportunity to develop their personality, giving each one an opportunity to get up and talk on some of the subjects that he knows more about than anybody else. I will be honest with you, my knees are shaking. I am no speech maker but if as a result of my work for this organization, I learn to be able to get up before you and talk on any of the subjects I might know about or write a decent article, I shall feel I am amply repaid for my work I have done or shall do."

A. M. Sargent, Secretary-Elect

"This introduction was more or less of a mis-representation. Mr. Siegel said he was introducing new officers. My understanding of the word *new* is, 'The first time used.' After the second time it second hand; and at this stage I don't know what it is.

"There isn't very much that I can say that will be of any importance. It is the same old job. There is no policy connected with it. The only thing that might be of general interest to the membership is something that I believe is generally over-looked. That is the fact that the Secretary's office can be in a good many instances of some benefit to the members. The reason I bring this up is because of various letters that come in from time to time. I will mention a few of them. We get letters from men out of town in reference to books pertaining to miscellaneous phases of the industry—die design, tool design, and so on. The Secretary doesn't know anything about books; but we do know of men in the organization that do, and of various sources where that information can be obtained. We will do the best we can to steer you to the correct sources.

"The same thing applies to schools. As far as employment is concerned, the Industrial Relations Committee is generally the father of that sort of thing. However, the Secretary's office has been used as a clearing house. We have tried the best to get men into jobs wherever we could and the biggest thing we have had to worry about is the cooperation of the men themselves. The men that want work, don't come in and keep in touch with or keep us informed of their lack of jobs or their re-employment so that we are not able to help them as we reaaly would like to.

"Anything along any of these lines that the Secretary's office can do to assist anybody, we will be glad to do to the best of our ability. It is mainly a job of service and it is up to you fellows to use it if you can."

J. F. Slavik, Trearurer-Elect

"There has been so much fine oratory tonight that it would be quite difficult to add anything to it. I certainly appreciate the re-appointment and anything I can do to further the cause of our Society, I will certainly be glad to do."

A TRIBUTE TO THE LADIES

(*Continued from page* 11)

It has taken hundreds of men to build our Society. We will never forget that it has also taken hundreds of women. In our zest we have failed to praise the ladies for their patience, helpfulness and encouragement. We have assumed that the ladies know that all we do is for their ultimate pleasure.

Dear Ladies: The members of the American Society of Tool Engineers, take this opportunity to thank you for having contributed more than we to the building of the American Society of Tool Engineers. We realize that nothing of lasting benefit has ever been built without the help of the ladies. We are proud of what you have helped us to build and will do our best to merit your pride in our Society.

ANNUAL SUMMER PICNIC

The second annual picnic of the American Society of Tool Engineers will be held some time around the middle of June. The exact date will be announced in the June Journal and also at the June meeting and probably by post card. The main idea of mentioning this event at this time is so you can make your plans to reserve a full day for the festivities.

Certainly every one who attended our picnic last year will not miss the fun this year. We have many new members who were not at last year's field day and to them we want to say that everyone who attended last year will treasure for a long time the memories of the childish fun enjoyed on this occasion last year.

DISPLACEMENT OF MEN

(*Continued from page* 10)

Further, they add, that if industry is to remain and not become petrified and out of existence, then progress must go on.

However, we have evolved a solution which if handled properly can be looked upon as a humanitarian one. It is this: Let the fixture or tool man go to his boss and say, "Mr. Boss! I find by designing this fixture and putting it in use that we displace five men. Won't you look around now before it happens and see what we can do to give these men reemployment?"

The point is, however, that progress must go on, for it is the long pull that counts. An immediate gain that results in an eventual loss is not a real gain.

And there are still long pull gains to be made. The air conditioning industry is just opening up. There are some 25,000,000 homes in the United States and if only 2,500,000 of them become air conditioned think what that means in the absorption of men for motors, compressors, piping, steel, cast iron, bronze, assemblers, installers, service men and what not.

Nor is air conditioning the only adventure before us! There are many others, and finally there is the great factor of obsolescence and depreciation which renders so many of our present buildings, equipment, and tools all out of date.

There are vast possibilities before us and we can only take advantage of them if we take the far-visioned view and see that progress is constantly maintained.

20 Years of Progress

May, 1934, marks our 20th Anniversary

From a modest beginning of making Interchangeable Counterbore and Spotfacing Tools to its present position, that of leader in its field, is the record of Eclipse.

The success we have enjoyed has been due to the confidence and support of our customers and the loyalty and cooperation of our factory and sales organizations.

Listed below are some of the tools developed within the Eclipse organization that have contributed to its enviable position in the cutter industry.

INTERCHANGEABLE COUNTERBORES
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Carpenter Sees Bright Future for A. S. T. E.

(Continued from page 5)

line-up for a certain type of part with which he is familiar enough to be called an expert. We would make these discussions very informal, provide a blackboard and colored crayon for sketches and no doubt uncover enough talent right in our own organization to make our meetings of more immediate practical value to our members.

A.S.T.E. Activities—New Committeemen

"In selecting the following committee chairmen to carry on this program attention and consideration were given not only to the man's fitness for the work but also to his desire to organize and carry out for the whole year his share of the work. As these appointments are made will the men named kindly rise and identify themselves.

"The Committee on which I am depending for more work of an outstanding nature than any other is the Standards Committee. It is therefore with great pleasure and expectation that I am able to announce as Standards Committee Chairman Bill Smila.*

"The work of collecting and disseminating through our Journal all information of a printed nature which is to reach our members will be carried on by the Publications Committee. I am happy to re-appoint as Chairman Mr. O. B. Jones.

"The Industrial Relations Committee is the one on which we depend to make and keep our harmonious contacts with employers and to assist in placing our members who are out of work. The Chairman of this Committee for the following year is to be Mr. Frank Gertiser.

"The Constitution and By-laws Committee gets the job of keeping our government up to date and also the important work of providing means for the establishment of local branches in other cities. The Chairman of this Committee for the coming year is to be Mr. Walter Wagner.

*Wm. H. Smila, recently made Master Mechanic, Chrysler Corporation, Jefferson Avenue Plant, Detroit.

"No definite appointments are ready yet for chairmanship on the Meetings Committee. We have only two more meetings this season those in May and June and as Joe Siegel has already tentative plans for them he has consented to conduct them.

"We are also going to have an Entertainment Committee this year, the Chairman of which is to be that man who has done so much for us in the past along these lines—Mr. Joe Siegel.

"I should like to remind you that the ambitious program of hard work we have planned for the coming year cannot be carried on by any man or any one group of members. While the Chairmen of the Committees are to choose their own members, I should like to ask that any of you who are interested in any phase of the work to get in touch with the Committee Chairmen or myself as soon as possible. In closing let me say that the only motive behind the work of your officers this year will be to make this a practical educational society of which you will be genuinely proud to be a member. Toward this end, I earnestly solicit your support."

A.S.T.E. Public Speaking Classes Held at Strelinger's

The sincere thanks of The American Society of Tool Engineers is extended to the Chas. A. Strelinger Company of Detroit, for the use of their conference room in conducting a course in public speaking sponsored by *The Society* for members.

This class in public speaking is under the direction of Mr. Harry Heffner. Its very reasonable cost is a splendid inducement to all members to join. Members interested should call the Secretary's office Mad. 2057 for full details.

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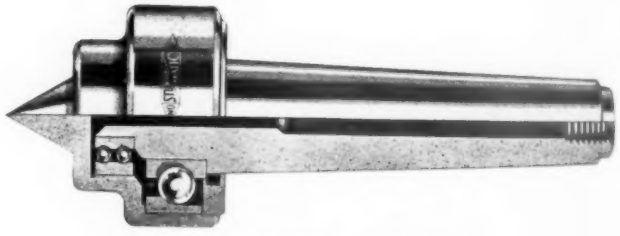

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Centering Machines
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If You Turn Bushings or Similar Parts—Read This

Bushings to turn! Thousands of them, made of thin steel tubing upset to form a flange on each end. Samples are shown in Fig. 1. Machine for turning them in Fig. 3. It is a Sundstrand Junior Stub Lathe with a clever

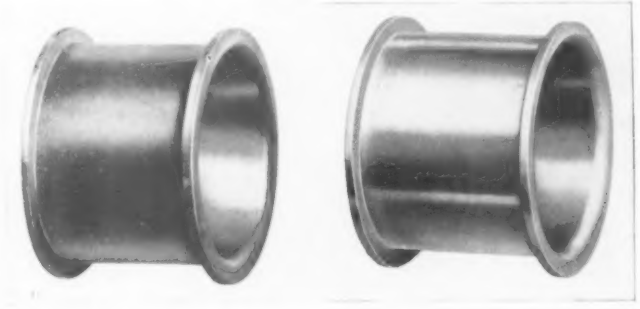

Fig. 1. Steel bushings turned on Junior Stub Lathe. At left, rough; at right, rough-turned.

mechanism on the front carriage to provide an automatic cycle of movement for the turning tools. The bushings are bored, and faced on one end in a previous operation. On the Junior Stub Lathe they are located by the finished end and gripped in the bore by an air-operated expanding driver. The operator then starts the spindle, the lathe does the rest. Front tools rapid traverse to the work, feed to depth, feed to left, rapid traverse out and back to starting position where the carriage stops — a complete full-automatic cycle. In the meantime tools on the cam-actuated rear slide advance, face both flanges and return.

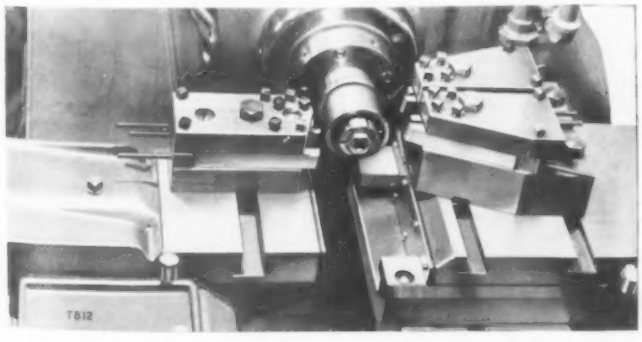

Fig. 2. Close-up showing bushing on driver, and tooling.

After coating with bearing metal, splitting, and other operations, the bushings are finish turned on other Sundstrand Junior Stub Lathes at speeds up to 3600 r. p. m., with tungsten carbide tools, for fine finish and high accuracy.

Manufacturers having bushings and similar parts to turn are invited to investigate the possibilities of the Sundstrand Junior Stub Lathe. This machine takes 18″ between centers, swings 12″ over bed ways, and has three optional spindle drives covering range from 128 to 3600 r. p. m. It is an extremely profitable producer on a wide variety of work. We'll be glad to submit proposals on standard or special applications.

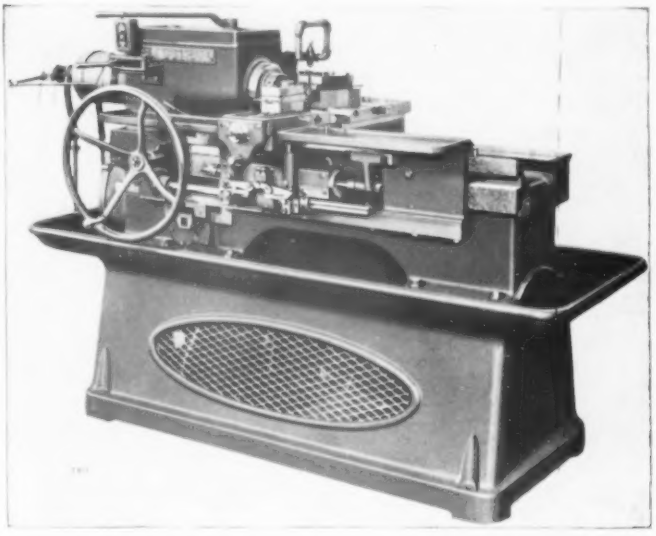

Fig. 3. Junior Stub Lathe for turning bushings. Cover on front of carriage removed to show automatic cycling device.

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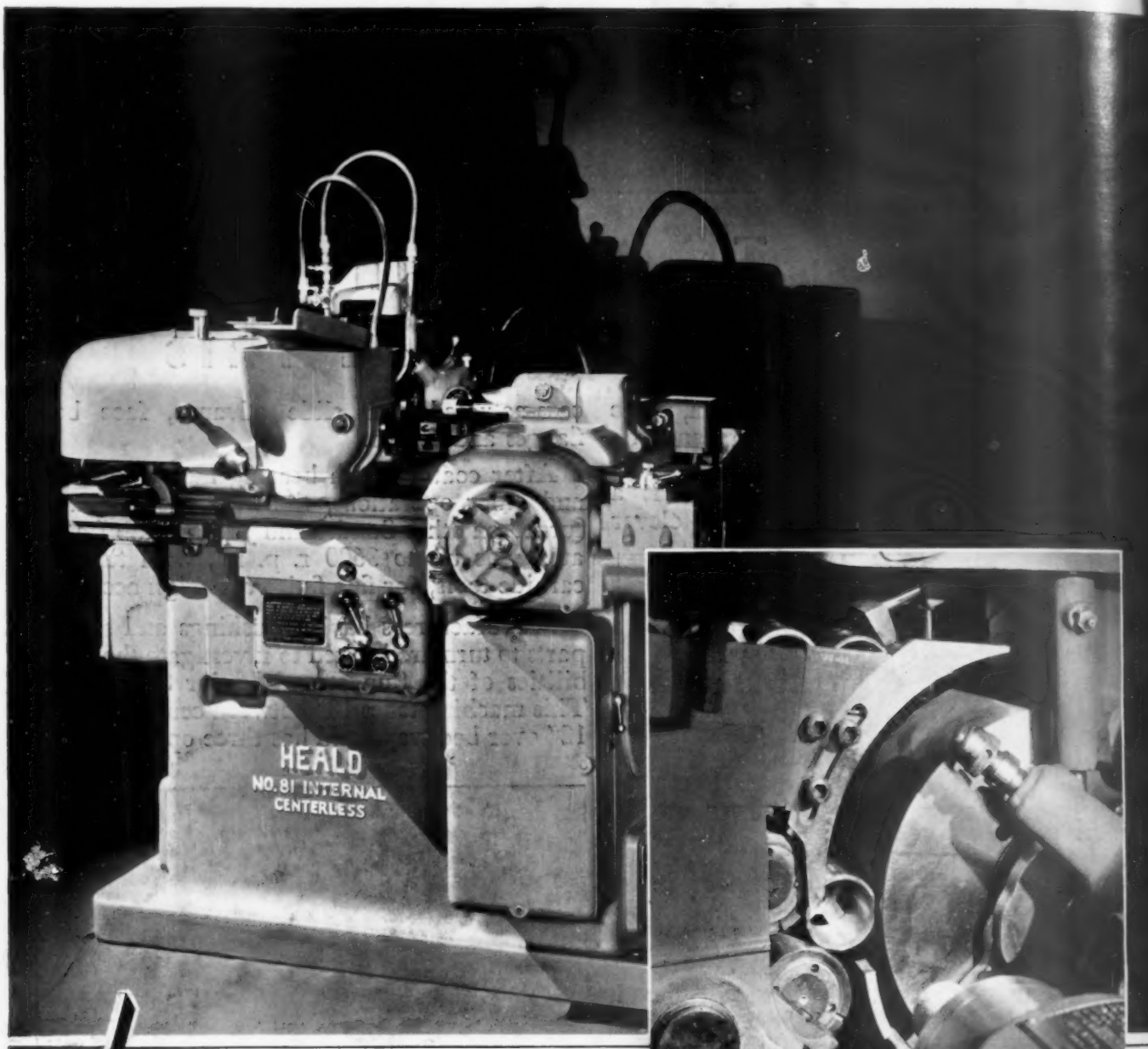

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A machine that makes possible a new process in the method of finishing the bores in many kinds of work. It assures the following results long desired and which previously have only been obtainable at the expense of much scrap and high cost.

CONCENTRICITY. Notice how the work is held in rolls with the outside diameter generating a path for grinding the bore and thus assuring the bore to be absolutely concentric with the outside diameter.

PERFECT WHEEL ACTION. Notice that the grinding wheel bears against the inner surface of the work at exactly the point where the outside contacts with the regulating roll and thus gives perfect wheel action.

SIZING. See the solid positive gage at the back end of the hole that tests the bore for size at each stroke of the wheel. When the gage enters, the bore is well within the required limits of accuracy.

FULLY AUTOMATIC. The work is held in a loading chute automatically dropping it into grinding position as the finished part is ejected over the regulating roll.

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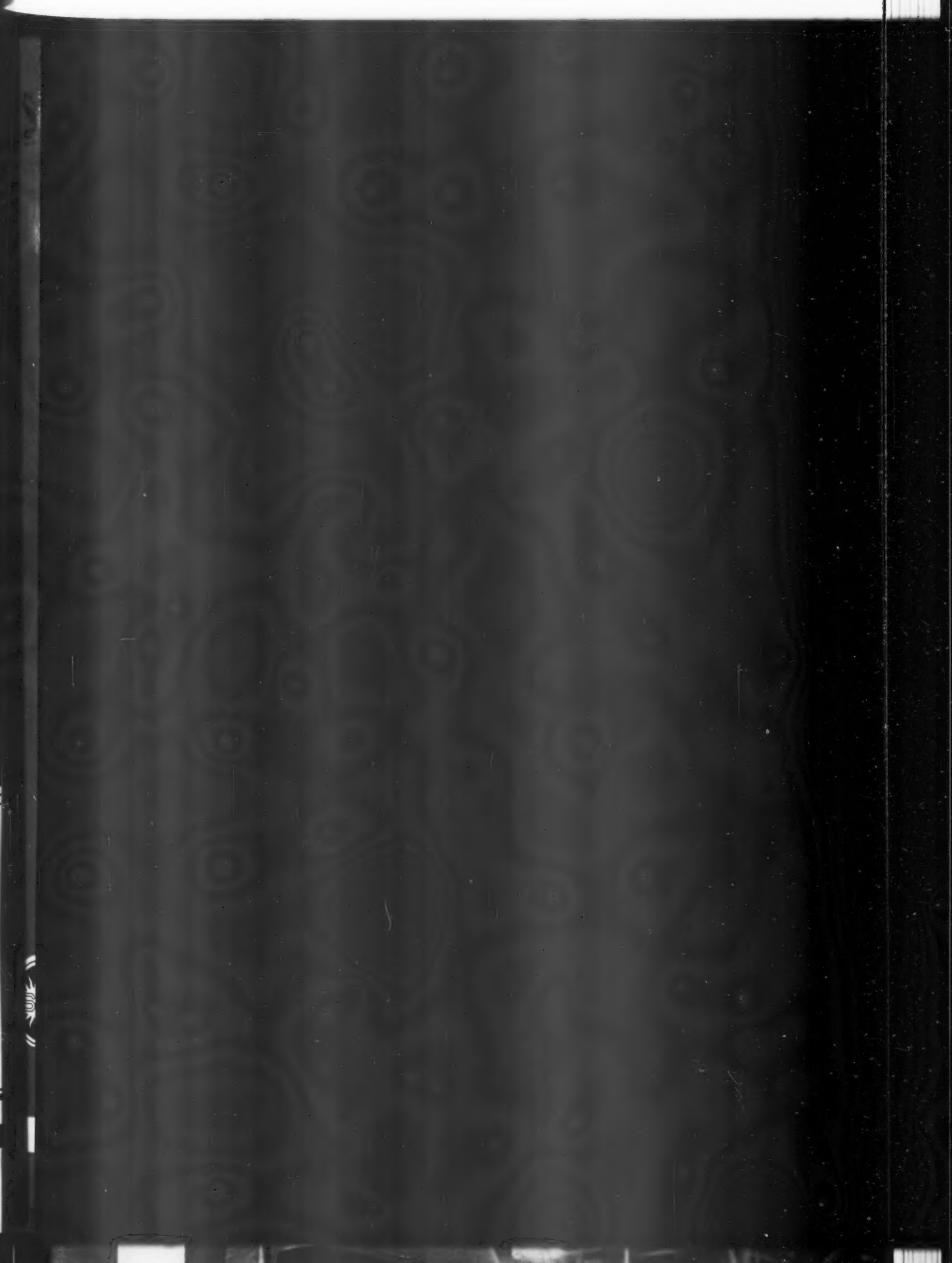
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